

# Funding Options for Freight Transportation Projects of National Significance

## *Case Studies of Freight Finance Options*

### ■ Introduction

Cambridge Systematics, Inc. (CS) was commissioned by the Transportation Research Board (TRB) to develop case studies on financing options for freight projects of national significance to support a special committee entitled *Funding Options for Freight Transportation Projects of National Significance* that currently is evaluating this topic. The purpose of these case studies is to help the committee to observe:

- Finance options that should be given consideration;
- Characteristics of projects that appear to have influenced the selection of finance arrangements and in particular, choices about user fees and subsidies;
- Connections between finance arrangements and the likelihood of success of projects;
- The role of Federal leadership or funding contributions in the projects;
- The nature and distribution of the benefits of the projects, especially circumstances where the value of a project from the national perspective differs from its value from a local perspective;
- State of the practice of prospective evaluation of freight project proposals, including public-private projects; and
- Alternative institutional arrangements for initiating and managing projects.

The four case studies selected to address the issues listed above are: Chicago CREATE; Reno ReTRAC; the Heartland Corridor (Virginia-West Virginia-Ohio); and the Trans-Texas Corridor I-35. These case studies were selected based on criteria developed by the committee. Table 1 summarizes the criteria for case study selection and how each case study measures against the criteria. Table 2 provides a summary of all four case studies, including: 1) project description; 2) organizational structure; 3) project benefits; and 4) funding and finance.

**Table 1. Selection Criteria for Case Studies**

Criteria	CREATE	ReTRAC	Heartland Corridor	Trans-Texas Corridor I-35
TIFIA or other credit assistance	No	Yes (TIFIA)	No	Yes (TIFIA for initial SH 130)
Privately instigated	Public/Private Initiation	Public/Private	Primarily Private	Public/Private
PPP with private sector funding and management of publicly owned facility	No	No	No	Yes (Segments 5 and 6)
Project-specific user charge as major source of funding	No	Yes	No	Yes
Earmarked Federal grant	Yes	Yes	Yes	No
Federal or state trust fund	Yes	Yes	Yes	Yes (initial SH 130 included state funds)
Meet FHWA's PNSR <sup>a</sup> criteria and/or already selected	Yes	Probably Not	Yes	Likely
Size of project	\$1.5 billion	\$280 million	\$309 million	\$5 billion (SH 130)
Project status	Construction of Phase I	Completed	Planning, design, and construction underway	Segments 1 through 4 completed or under construction; CDA recently signed for Segments 5 and 6

<sup>a</sup> PNSR = Projects of National and Regional Significance.

Table 2. Summary Information of Case Studies

	CREATE	ReTRAC	Heartland Corridor	Trans-Texas Corridor I-35
<b>I. Project Description</b>				
Description	Rail corridor improvements, including: grade separation (rail-rail and highway-rail); safety enhancements; system upgrades; other.	2.3 miles long, 33-foot-deep trench to accommodate and separate rail traffic through downtown Reno.	Double-stack clearance between Roanoke, Virginia, through West Virginia to Columbus, Ohio; three intermodal facilities; and rail line relocation.	Toll road; full TTC includes truck lanes, separate freight and passenger rail lines; utility corridors.
Status	Underway (Phase I): • Start: 2007 • Completion: N/A	Completed: • Start: August 2002 • Completion: 2005	Underway: <i>Rickenbacker Intermodal Facility</i> • Start: Summer 2005 • Completion: March 2008 <i>Commonwealth Railway Relocation</i> • Start: July 2007 • Completion: N/A <i>Double-Stack Clearance</i> • Start: Fall 2007 • Completion: N/A	Segments 1 through 3 of SH 130 completed; Segments 4 through 6 underway <i>Segments 1 through 4</i> • Start: 2002 • Completion: Spring 2008 (expected) <i>Segments 5 and 6</i> • Start: N/A • Completion: N/A (Planning/NEPA process underway)
<b>II. Organization</b>				
Responsible Entity and Organization Structure	Public-Private Partnership between state, City of Chicago, and railroads.	City of Reno	Norfolk Southern for double-stack clearance and Rickenbacker intermodal facility; Virginia Port Authority for rail line relocation; Virginia and West Virginia for planned intermodal facilities.	TxDOT
Primary Source of Leadership	State DOT/City of Chicago	City of Reno	Norfolk Southern	TxDOT
Stakeholders	<ul style="list-style-type: none"> <li>• State of Illinois</li> <li>• City of Chicago</li> <li>• Metra</li> <li>• Amtrak</li> <li>• Burlington Northern Santa Fe</li> <li>• CN</li> <li>• Canadian Pacific</li> <li>• CSX</li> <li>• Norfolk Southern</li> <li>• Union Pacific</li> <li>• Belt Railway Company of Chicago</li> <li>• Indiana Harbor Belt Railroad</li> </ul>	<ul style="list-style-type: none"> <li>• City of Reno</li> <li>• Washoe County</li> <li>• State of Nevada</li> <li>• Union Pacific</li> <li>• Downtown Casinos and Businesses</li> </ul>	<ul style="list-style-type: none"> <li>• States of Virginia, West Virginia, and Ohio</li> <li>• Virginia Port Authority</li> <li>• Columbus Regional Airport</li> <li>• FHWA</li> <li>• Eastern Federal Lands Highway Division</li> </ul>	<ul style="list-style-type: none"> <li>• TxDOT</li> <li>• Texas Transportation Commission</li> <li>• Fluor</li> <li>• Cintra-Zachry</li> </ul>

Table 2. Summary Information of Case Studies (continued)

	CREATE	ReTRAC	Heartland Corridor	Trans-Texas Corridor I-35
<b>III. Benefits</b>				
Road Congestion	Medium	High	Low	High
Rail Congestion	Medium	High	Low	N/A
Air Quality	High	Medium	Medium	Low
Other	<ul style="list-style-type: none"> <li>• Safety - Medium</li> <li>• Economic Development - High</li> <li>• Redevelopment - Low</li> </ul>	<ul style="list-style-type: none"> <li>• Economic Development - Medium/High</li> <li>• Safety - High</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced freight rail travel times - High</li> <li>• Economic Development - High</li> <li>• Safety - Medium</li> </ul>	<ul style="list-style-type: none"> <li>• Safety - Medium</li> <li>• Economic Development - Medium</li> </ul>
<b>IV. Finance</b>				
Project Costs:				
i. Capital	<ul style="list-style-type: none"> <li>• \$1.5 billion (full project)</li> <li>• \$330 million (Phase I)</li> </ul>	• \$280 million	• \$309 million	<ul style="list-style-type: none"> <li>• \$5 billion (SH 130)</li> <li>• \$200+ billion (full TTC-35)</li> </ul>
ii. Operating/Other	N/A	N/A	N/A	N/A
Sources of Fund	<ul style="list-style-type: none"> <li>• Federal Grants/Earmarks - 30.3%</li> <li>• State - 30.3%</li> <li>• Local - 9%</li> <li>• Private - 30.3% (Phase I)</li> </ul>	<ul style="list-style-type: none"> <li>• City of Reno - 28%</li> <li>• Federal Grants/Earmarks - 8%</li> <li>• Private (UP) - 6%</li> </ul>	<i>Doubles Stack Clearance</i> <ul style="list-style-type: none"> <li>• Federal Earmark - 63%</li> <li>• VA and OH grants - 7%</li> <li>• Private (NS) - 30%</li> </ul> <i>Roanoke Intermodal Facility</i> <ul style="list-style-type: none"> <li>• VA grant - 70%</li> <li>• Private (NS) - 30%</li> </ul> <i>Rickenbacker Intermodal Facility</i> <ul style="list-style-type: none"> <li>• Federal Earmark - 49%</li> <li>• Private (NS) - 51%</li> </ul> <i>Commonwealth Railway Relocation</i> <ul style="list-style-type: none"> <li>• Federal Earmark - 25%</li> <li>• State Grants/Matching Funds - 72%</li> <li>• Private (Commonwealth Railway) - 2%</li> </ul>	<i>Segments through 4:</i> <ul style="list-style-type: none"> <li>• State/Local - 38%</li> </ul> <i>Segments 5 through 6</i> <ul style="list-style-type: none"> <li>• Private Equity - 25%</li> </ul>
Loans and Credit Assistance	N/A	<ul style="list-style-type: none"> <li>• TIFIA - 18% (\$50.5 million)</li> <li>• City of Reno Bonds - 40% (\$111.5 million)</li> </ul>	N/A	<i>Segments 1 through 4:</i> <ul style="list-style-type: none"> <li>• TIFIA - less than 1% (\$16.8 million)</li> <li>• TxDOT fuel tax bonds - 62% (\$2.3 billion)</li> </ul> <i>Segments 5 through 6:</i> <ul style="list-style-type: none"> <li>• TIFIA - 31% (\$412.1 million)</li> <li>• Private debt - 44% (\$596.5 million)</li> </ul>

## ■ Chicago Region Environmental and Transportation Efficiency (CREATE) Program

The CREATE program encompasses the rationalization, reconstruction, and upgrade of five passenger and freight rail corridors in Chicago: 1) Belt Railway East West Connector; 2) UP/CSX/NS Western Avenue Corridor; 3) CSX/Indiana Harbor Beltway Corridor; 4) Metra Southwest Service Passenger Express Corridor; and 5) a new Central Corridor that connects CN-Wisconsin Central with Eastern Class I railroads. The cost of the CREATE program is estimated at \$1.534 billion for approximately 78 projects, including:

- Grade separation of six railroad crossings (rail-rail flyovers);
- Grade separation of 25 highway-rail crossings;
- Viaduct improvements;
- Grade crossing safety enhancements; and
- Extensive upgrades of tracks, switches, and signal systems.

The total program costs are distributed at about \$500 million per major program element (i.e., rail-rail flyovers, highway-rail separation, and rail improvements). Thirty-two projects are planned for design and/or construction for the initial three-year plan (2007-2009). The projects that have advanced into this phase include six highway-rail grade crossing separations, four rail-rail flyovers, 21 railroad infrastructure improvements (tracks, switches, and signals), and the viaduct improvement program.

The CREATE program is aimed at addressing existing and future congestion issues on the rail system, which are expected to bring adverse effects to the national economy and the transportation system if they are not addressed in the near future. The CREATE program is a public-private partnership that includes the Illinois Department of Transportation (IDOT), the City of Chicago Department of Transportation (CDOT), Metra, Amtrak, six of the largest North American freight railroads (Burlington Northern Santa Fe, CN, Canadian Pacific, CSX, Norfolk Southern, and Union Pacific), and switching railroads Belt Railway Company of Chicago (BRC) and Indiana Harbor Belt Railroad (IHB).

### Project History

The CREATE program was developed as a response to the need for improved freight mobility through Chicago, which was particularly evident after a major snowstorm in 1999. Interstate highways and freight rail yards were impassable and the effects of the resulting freight gridlock created a ripple effect across the North American rail network. In addition, the CN planned to acquire the Illinois Central, and the acquisition of Conrail assets by NS and CSX was expected to increase rail traffic in the region. The Mayor of Chicago, Richard M. Daley, took action with the interests in Chicago and challenged the carriers to develop a coordinated plan to keep freight fluid. The Illinois DOT and the Chicago DOT worked with the passenger and freight rail railroads to identify the needs of the region's stakeholders, which resulted in the CREATE program.

In early 1999, the Association of American Railroads (AAR) created the Chicago Planning Group (CPG), which included several passenger and freight railroads serving the Chicago region, to study and provide solution to the rail congestions issues in the region. The study by the CPG recommended improvements to signal systems, expansion of main track capacity, and grade separation of some Metra operation from freight routes and highway-rail crossings that were problematic for rail operations and highway users. At that point, in the absence of an evaluation of the effectiveness and benefits of the proposed improvements and uncertainty about funding options, no overall plan emerged.

Between 1999 and 2001, several groups were created to deal with freight rail issues in the region. In late 1999, the CPG created the Chicago Transportation Coordination Office (CTCO) to develop managerial solutions to railroad operating problems, to work with public agencies on the public impacts of rail service, and to assist in continuing the capital planning process. Improvements to coordination and communication between railroads were accomplished and an emergency operations process was developed. In 2000, a Freight Transportation Working Group was created by civic groups to research regional freight issues and make recommendations to planners and leaders. Mayor Daley continued to push for coordinated planning on rail issues. In 2001, the Chicago Rail Task Force was created, including representative from the freight railroads and Chicago DOT.

In 2002, the railroads acquired a rail network simulation model that helped assess rail operations in the region and to test proposed improvements. Also in 2002, the railroads met to discuss possible rail infrastructure improvements. The list of proposed improvements was refined over 2002/2003 until a plan acceptable to all parties was developed. The final plan also included viaduct repair and rail crossing improvements proposed by Chicago DOT, and the priority for highway-rail crossing separation was determined by taking into consideration several studies from the CTCO, the Illinois Commerce Commission, the DuPage Council of Mayors, and the Chicago Area Transportation Study. "Joint Statements of Understanding" (JSU) were signed among public and private sector stakeholders in June 2003, and the final CREATE plan was issued in August 2003, after a long collaborative process among public and private partners.

The next step was to obtain funding to implement the program. The cost of the CREATE program was estimated in 2003 at \$1.534 billion, of which \$232 million will come from the railroads, as specified in the JSU. The percentage of private participation was based on an estimation of the economic benefits that the private sector will gain with the implementation of the program, as determined through analysis conducted by the railroads. This was reviewed by public sector representatives for reasonableness. The remaining funding will come from the public sector, including Federal, state, and local partners.

Federal funding was earmarked to the program in SAFETEA-LU, in part through efforts of a key supporter of the CREATE program, former House Representative William Lipinski. Congressman Lipinski was a member of several subcommittees of the House Transportation and Infrastructure (T&I) Committee, including the T&I Subcommittee on

Railroads. Congressman Lipinski retired from his post in January 2005 before SAFETEA-LU was authorized so it was left to others to champion the project during final Congressional deliberations. The project had hoped to get upwards of \$500 million in SAFETEA-LU monies but last minute conference earmark negotiations resulted in CREATE getting only \$100 million for fiscal years 2005 through 2009, through the “Projects of National and Regional Significance” (PNRS) program.

Given funding limitations, the CREATE program will be implemented in phases, with Phase I currently underway. The cost of Phase I is \$330 million, of which \$100 million comes from the PNRS program, \$100 million from the freight railroads, and \$30 million from the City of Chicago. The State of Illinois is expected to provide the remaining \$100 million to fund Phase I, which depends largely on whether a state capital bill is passed in 2007. Of the 32 projects in Phase I, two have been completed, while the remaining projects currently are in design or construction. The CREATE partnership will pursue additional Federal funding in the next reauthorization, and also plans to pursue nontraditional sources for transportation funding.

## **Institutional and Organization Arrangements**

The completion and implementation of the CREATE program required strong support and leadership from the public sector. Significant time and effort was required to bring the parties to the table in a neutral environment. Mayor Daley played a critical role in engaging all parties in the development of a unified plan. In December 2000, Mayor Daley sent a letter to the Surface Transportation Board (STB) emphasizing the need for coordinated planning for freight rail. The STB responded with a letter to AAR supporting the Mayor’s concerns. The communication between Mayor Daley and STB led to the creation of the Chicago Rail Task Force, that led to the development of the CREATE program.

In June 2003, the program partners signed a JSU that identified the roles and responsibilities of the partners, creates a governance structure, and also defined the private funding contribution levels. IDOT is the lead agency in the programming and grant administration of public funds. Projects were divided in three categories, which also define partner responsibilities:

1. Railroad improvements, excluding rail-rail separation (Railroad Components);
2. Rail-rail separation (Metra Components); and
3. Public improvements, including separation of at-grade highway-rail crossings, viaduct improvements, and grade crossing safety enhancements (Public Component – IDOT and Chicago DOT).

The governance structure of the CREATE program was modified in 2007 to include the following groups (see Figure 1):

- **CTCO** – Among its responsibilities, the CTCO approves assumptions related to train operations and performance, and ensures optimal rail operations during construction.
- **Project Office** – The Project Office is administered by AAR, and it is responsible for keeping track of all projects, approving final designs and cost estimates, assisting with grant application, and is a liaison between the Component Project Managers and other groups. The Project Office analyzes or initiates requests related to changes in project scope and/or costs, and advises the Management Committee of proposed actions.
- **Stakeholder Committee** – The Stakeholder Committee has three members: president and CEO of AAR, Chicago DOT commissioner, and IDOT Secretary. This committee sets policy for the CREATE program and approves any changes in scope or budget. This committee provides final resolution on all stakeholder issues and makes decisions by unanimous agreement.
- **Management Committee** – The Management Committee is comprised of one member from CTCO, Metra, BNSF, CN, CP, CSX, NS, UP, AAR, CDOT, and IDOT, as well as nonvoting members from Amtrak BRC, IHB, and FHWA. This committee reviews and approves project designs, project cost estimates, and construction assumptions and makes decisions regarding scope, schedule, and budget based on recommendations from the Implementation Team. The committee makes decisions by unanimous agreement, although any member may elevate an issue to the Stakeholder Committee.
- **Implementation Team** – The Implementation Team is comprised of one member each from CTCO, Amtrak, Metra, BNSF, CN, CP, CSX, NS, UP, BRC, IHB, AAR, CDOT, and IDOT. The Implementation Team tracks budget and construction progress and recommends project changes.
- **Finance and Budget Committee** – The Finance and Budget Committee is comprised of one member each from CTCO, Amtrak, Metra, BNSF, CN, CP, CSX, NS, UP, AAR, CDOT, and IDOT and reports to the Management Committee. This committee's works with the Advocacy Committee to identify sources of public funds and monitors project cost estimates versus actual expenditures, and assists project managers with financial management issues.
- **Advocacy Committee** – The Advocacy Committee is comprised of one member each from CTCO, Amtrak, Metra, BNSF, CN, CP, CSX, NS, UP, AAR, CDOT, and IDOT and reports to the Management Committee. The Advocacy Committee is responsible for all CREATE communications, addressing community concerns, and advocating for CREATE.
- **Tech Review Team** – This team is comprised of one member each from the railroads, IDOT, and CDOT and reports to the Implementation Team. This team works with project managers on detailed scope, schedule, and budget issues.
- **Project Managers** – Each project in the CREATE program was designated to one or more partners, who become the Project Managers. The component Project Managers are responsible for all phases of development through implementation, including



design and construction, and are responsible for keeping track of project status and potential scope/cost changes. The Project Managers report to the Implementation Team through the Tech Review Team.

**Figure 1. CREATE Governance Structure**



## Project Benefits

As part of a systemwide upgrade, three main stakeholder groups will benefit. Freight shippers will benefit through additional routes and capacity. Passenger traffic will benefit from the new express corridor and other capacity improvements (signaling, switches, and flyovers) that will result in improved timekeeping, and highway users benefit through reduced congestion due to grade separation and more efficient rail traffic routing. Railroads will benefit from reduced fuel consumption and operating expenses, increased rail capacity, faster and more reliable deliveries, and better utilization of rolling stock.

The CREATE program also will produce significant local, regional, and national benefits. Public benefits were estimated using tools from the Illinois DOT and the Chicago Area Transportation Study (CATS); these were reported in two white papers posted in the CREATE web site, at <http://www.createprogram.org>. An overview of the estimated benefits is presented below.

### ***National Benefits***

- **Inventory Reductions** - The CREATE program will expedite the movement of rail cargo throughout the Chicago region, saving money for rail customers who will be able to reduce their inventory levels. Shippers will save an estimated \$40 million annually in reduced inventory costs, which could increase over time as rail customers are allowed to make further reductions in their inventories due to improved reliability of rail service.
- **Highways and Highway Congestion Relief** - The 2003 *Freight-Rail Bottom Line Report* estimated that an investment of \$30 billion in public funds in freight rail infrastructure would yield significant returns, including at least \$10 billion in reduced highway needs and \$238 billion in reduced highway user costs (decreased travel time, operating costs, and accident costs) over 20 years. From this, the CREATE team estimated that its project could yield more than \$10 billion in national savings from reductions in highway needs and user costs.

### ***Local and Regional Benefits***

Table 3 summarizes the estimated regional benefits of the CREATE program. Air quality benefits are estimated at \$1.1 billion and construction benefits are estimated at \$2.2 billion. Regional benefits related to rail passengers, drivers, and safety are estimated at \$595 million. These benefits are described in more detail as follows:

- **Rail Commuter Time Savings** - Rail-to-rail flyovers separating rail passenger operations from rail freight operations will result in more reliable commuter rail service, reduced travel times, and increased capacity on the existing SouthWest and Heritage lines, and will permit the use of the LaSalle Street Station - freeing capacity at Chicago's Union Station. Faster travel times and improved reliability will enable the commuter rail service to attract additional passengers who would otherwise travel by personal automobile, both currently and in future years. The value of time savings realized by current and additional rail commuters is estimated to be \$115 million on the SouthWest line and \$17 million on the Heritage line, for a total savings of \$132 million. In addition, the time expected to be saved by current rail commuters who switch to these two lines has a present value of up to \$58 million, producing a total time savings valued at up to \$190 million.
- **New Highway Construction Reduced** - The reduction in commuters traveling by personal automobile will reduce vehicle miles traveled (VMT) by an estimated 29 million per year in the SouthWest Service and five million in the Heritage Corridor, resulting in at least \$77 million less investment in highway construction to handle those trips. Additional savings will be realized as current commuter rail users switch to these two lines and drive shorter distances.
- **Highway Accidents Reduced** - The reduction in highway travel also results in fewer accidents, less damage to property, and fewer fatalities. Benefits from improved highway safety are estimated at \$94 million.

- **Local Highway Delay Reduction** - The highway-rail grade separation projects, together with the associated crossing closings, will reduce delays for Chicago-area motorists at grade crossings. Travel delay savings have been estimated at \$202 million.
- **Grade Crossing Accidents Reduced** - Safety benefits for the 25 crossings were based on safety incident data collected between 1977 and 2001. The present value of the sum of incidents is estimated to be \$32 million through 2042.
- **Energy and Environmental Benefits** - Benefits from emissions savings are the result of reduced railroads' diesel consumption and delays at highway-rail crossings. The emissions reduction is estimated as follows:
  - NO<sub>x</sub> reductions of almost 1,460 tons by 2007 - over 2,200 tons by 2042;
  - CO reductions of almost 440 tons by 2007 - over 930 tons by 2042;
  - VOC reductions of over 100 tons by 2007 - almost 170 tons by 2042; and
  - PM reductions of over 50 tons by 2007 - over 70 tons by 2042.

If the CREATE Program were to be funded purely on the basis of NO<sub>x</sub> reduction at the same rate that Chicago CMAQ projects were funded in 2003, this would equate to \$1.12 billion in Federal funds related just to NO<sub>x</sub> reducing aspects of the CREATE Program (60,802 tons of NO<sub>x</sub> eliminated over 40 years).

- **Construction Benefits During CREATE Program Construction** - The benefits throughout the construction period were analyzed at three levels:
  - Direct effects include the purchases of materials used for construction and the payment of wages and salaries to construction workers;
  - Indirect effects include the secondary effects that result when directly connected supply industries purchase materials or labor to produce goods or services needed to meet the new demand generated by the earlier, initial activity; and
  - Induced effects result from the additional spending by the workers associated with direct or indirect economic activity.

The construction-related benefits will include an estimated annual average of over 2,700 full-time job equivalents and over \$365 million in output over the construction period.

Other benefits were noted (such as redevelopment of the lakefront by eliminating the St. Charles Airlines route, and enhanced emergency response), but not measured since they were considered secondary benefits.

**Table 3. Summary of Regional and Local Benefits from Project CREATE**

<b><i>Rail Passenger Service</i></b>	
Commuters' time saved	\$190 Million
New highway construction reduced	77
<b><i>Motorists</i></b>	
Reduced delays at grade crossings	202
<b><i>Safety</i></b>	
Highway accidents reduced	94
Grade crossing accidents reduced	32
<b><i>Construction</i></b>	
Wages, material, and other purchases (including 16,217 employee years)	2,194
<b><i>Air Quality</i></b>	
Emission reductions (valued at CMAQ grant levels)	1,120
<b><i>Additional Benefits</i></b>	
Improved rail freight service to Chicago region	
Enhanced delivery of emergency services	
Lakefront land use increased	
Facilitate reduced "rubber tire" interchanges	
Energy conservation	

Source: CREATE program web site, <http://www.createprogram.org>.

## Finance Arrangements

As mentioned earlier, the total cost of the CREATE programs is estimated at \$1.534 billion, of which \$330 million is planned to be constructed over the 2007-2009 period. Phase I includes 32 projects as described above. Funding for Phase I comes from the following sources:

- SAFETEA-LU Programs of National and Regional Significance – \$100 million;
- State of Illinois – \$100 million (uncommitted);
- Freight Railroads – \$100 million; and
- City of Chicago – \$30 million.

As mentioned above, the railroads are committed to provide \$232 million for the CREATE program, based on the share of private benefits. Since the majority of the work will be completed on railroad-owned right-of-way, the land ownership will be considered part of

the private contribution, in addition to cash. According to NCHRP 8-53 study, the railroad stakeholders in the CREATE project were opposed to any tolling for freight movements along the proposed corridor; therefore, funding for the project did not include or considered potential application of toll collection or user fees. The terms and conditions of the CREATE JSU specify that no user fees, taxes, or assessments will be used to pay for the program.

The CREATE partnership will pursue additional Federal funding in the next reauthorization. In addition, the CREATE partnership will look into nontraditional funding sources for transportation to support implementation of the remaining program elements, although specific information on these potential funding sources is not available.

## Methods of Evaluation for Decision-Making

### *Estimation of CREATE Program Benefits*

The public-benefits analysis relied upon transportation modeling resources of IDOT, CATS, and some additional methods. Accident reductions from improved crossings and less congested highways were estimated based on travel demand model results. Safety benefits associated with grade crossing separations were estimated based on historical accident rates at the specified 25 crossings, with assumptions about traffic growth at these locations.

The rail operators' study relied on the rail simulation model to estimate rail network performance changes for both freight and passenger rail activity. This modeling revealed network performance changes under different allocations of a specific mix and volume of rail traffic over the network. Railroad operators then determined the associated scheduling, costs of operations, as well as rate structures based on simulation results.

The economic impact of inventory reduction savings was estimated by multiplying the time saved on freight movement by value of delay, all at the commodity-specific level. These savings represent direct cost savings that would result from not holding the shipments in inventory longer as a result of faster trips. Benefits related to increased reliability were not measured.

Cost savings from reduced highway construction needs was derived using different methods for the national and regional estimates. At the national level, these benefits were estimated using AASHTO's Freight Rail Bottom Line Report. For the regional estimate, Metra provided forecasts of passenger growth on the Southwest and Heritage lines, and CATS and IDOT provided forecasts of car pooling growth and average decline in trip length, all of which results in reduced VMT. The Highway Economic Requirement System (HERS) model was then able to assign the investment savings to the regional highway system based on reduced VMT.

The value of emissions reductions were estimated using reductions of rail-fleet idling time and automobile/truck delay improvements at the 25 highway-rail grade crossing

separations, and at 163 improved at-grade crossings. Rail simulation results on railcar time saved and current emissions standards from EPA for locomotive emissions were used with data from CATS' CMAQ analysis for approved NO<sub>x</sub> projects as the basis for monetizing the pollutant tons averted. Automobile/truck emission reductions were identified in part from the rail simulation results of improved rail activity at the crossing points and from CATS data on existing and future highway traffic. Finally, the economic impact resulting from construction of CREATE projects was estimated using a regional input-output model.

The study of private benefits began when the CREATE proposal was finalized among the rail operators, based on simulation results from their private study. The explicit decision methods used to develop the program are not known to the public, due to the confidentiality nature of the railroads' study.

### ***Railroad Simulation Model***

The CPG contracted Berkley Simulation to provide a rail simulation model for CREATE analysis. This model was used to assess the existing issues in the rail network, and improvement scenarios also were evaluated. This tool was used to assist the railroads in the decision-making process of the rail infrastructure improvements to be included in the CREATE program.

### **Comparison of Outcomes to Expectations**

The CREATE program currently is under implementation, and no information is available related to program outcomes versus program expectations. Clearly, the program is going to take longer to implement than the original estimated six years because of the less than hoped SAFETEA-LU funding.

## **■ Reno Transportation Rail Access Corridor (ReTRAC)**

The ReTRAC project consisted of the construction of a 33-foot-deep trench below existing tracks to separate automobile traffic from rail traffic in downtown Reno. The railway transportation corridor is approximately 2.3 miles long, consisting of two mainline tracks, constructed to standards permitting maximum train speeds of 60 miles per hour, an access road adjacent to and on the south side of the tracks within the below grade corridor, and the reconstruction of 11 (10 existing and one new) street crossings built as street "bridges" across the top of the depressed trench.

There are no turnouts or connections to other tracks within the project area except for the Reno Branch Connection Track. Prior to severing UP's existing mainline tracks for construction of the trench portion of the ReTRAC Project, a "shoo-fly" track was constructed adjacent to the existing mainline tracks. This "shoo-fly" track served as a temporary bypass route for trains during the construction.

## Project History

The Union Pacific Railroad's Central Corridor mainline between Oakland, California and the Midwest runs directly through downtown Reno, separating many of the casinos and other downtown businesses from other parts of the city. The City of Reno's interest in modifying this corridor to reconnect the city dates back to the Great Depression, when the United States Bureau of Public Roads proposed that the railroad be elevated. At that time, the Reno City Engineer recommended that the tracks be depressed instead, to avoid creating a barrier through the city. By 1942, the Chamber of Commerce endorsed the depressed trainway project as the "number one civic improvement for the readjustment period after the war." Subsequent reports in 1944, 1968, 1972, 1976, and 1980 described the benefits of a depressed railroad and updated the project's estimated costs.

The proposed merger of the Union Pacific (UP) and Southern Pacific (SP) Railroads in 1995 and its subsequent approval by the Surface Transportation Board (STB) presented the City of Reno with an opportunity to address this long-standing transportation and public safety issue. The UP acknowledged that rail traffic along the Central Corridor line could potentially increase from 14 trains a day to 24 or more within five years. The City of Reno quickly recognized that the potential existed for significant impacts on ground transportation, pedestrian safety, service delivery systems, and other environmental factors in the city as a result of the merger. The City engaged consulting teams to conceptually investigate a range of alternative methods to mitigate those potential impacts and appealed to (and even sued) the STB to encourage them to recognize and require UP to mitigate potential transportation, noise, and safety impacts to the city.

Beginning in April 1996, the city, in conjunction with UP and (the then-separate) SP Railroads, funded a "Railroad Merger Mitigation Alternatives" study. The study identified alternatives, preliminary cost estimates, and schedules. The City Council's analysis established the Reno Transportation Rail Access Corridor (ReTRAC) Project, a below grade railroad transportation corridor, as the best long-term value for the region.

An Environmental Impact Statement (EIS) was prepared and a Record of Decision (ROD) was issued in 2001. A design-build contract was awarded in August 2002, moving the project forward into the design and construct phases. The construction phase took only 18 months. The depressed rail trench was completed and opened to rail traffic in September 2005, with most project elements completed in 2006. After construction was completed, the City of Reno became owner of former UP's right-of-way along the 2.3-mile corridor.

The ReTRAC project also included a series of pedestrian enhancements around the tracks. While most of these enhancements have been completed, only one remains outstanding, consisting of a pedestrian plaza encompassing an area over two blocks above the trench. The design-build contract has been extended for two more years, and the City of Reno currently is in the process of securing funding to complete this final pedestrian enhancement.

## Institutional and Organizational Arrangements (Construction/Operation)

One of the keys to the successful implementation of the ReTRAC project was the identification of the key regional stakeholders and the ability of the City of Reno to describe potential benefits of the project to those stakeholders. In the early stages of approving the funding sources for the project, there was significant opposition to the implementation of a sales tax to support project implementation. As shown in Table 4, the UP railroad, downtown businesses, and city residents all stood to gain some benefits from this project, although in different areas (e.g., congestion, air quality, economic growth). The ability of the City of Reno to understand the types of benefits that the different stakeholders were interested in allowed them to engage and build advocacy among many different groups, including citizens/legislators, businesses/industry, and the private sector freight transportation industry. By understanding who the players involved were and what their interests were, the city was better able to describe how the ReTRAC project benefits could accrue to each of these individual stakeholders. Being able to describe these benefits and how they would accrue to different groups helped open the door to discussing how costs could be shared by those stakeholders.

**Table 4. ReTRAC Stakeholders and Key Issues**

Stakeholder	Public Safety	Traffic Congestion	Air Quality	Economic Growth	Noise
City of Reno	●	●	●	●	●
Washoe County	○	○	●	●	○
State of Nevada	○	●	●	●	○
UP Railroad	○	●	○	○	○
Casinos and Downtown Businesses	○	○	○	●	●

- Very important.
- Somewhat important.
- Not Important.

The City of Reno and its contractors worked closely with UP throughout the planning and construction process. The UP was given considerable power during the decision-making process, which eventually benefited the city through UP's financial contributions to the project and the continuance of rail service to downtown businesses during the construction period. Weekly communication between UP and the City of Reno ensured a good working relationship and that each party's expectations were met throughout the entire process.



## Project Benefits

The primary benefits of the ReTRAC project, as identified by project sponsors, are: 1) safety improvements; 2) reduced delays; 3) opportunity for redevelopment and aesthetic improvements in downtown Reno; 4) improved air quality; and 5) economic development.

Public benefits realized through the implementation of this project include:

- Reduced vehicle delays and congestion, noise and emissions, and safety improvements for vehicles and pedestrians by the removal of 11 at-grade crossings;
- Increased safety by eliminating the impact on hotels and businesses of a fatal derailment in the corridor;
- Improved emergency response for emergency vehicles using the current at-grade crossings;
- Allows for containment of hazardous spills within the downtown area;
- Provides a connection within the City of Reno that was once divided by the rail line going through the city;
- Increased property tax levies by increasing property values;
- Provides an opportunity for redevelopment and aesthetic improvements in the downtown area;
- Job creation and economic development; and
- Allows for improved efficiency in regional transportation.

Private sector benefits include improved and more efficient freight rail operations. The rail speed through downtown Reno was 20 miles per hour before the completion of the project. The project allows rail speeds of 60 miles per hour. The trench also allows for more flexibility in operations, by providing a staging area within the tracks, without impacting vehicular traffic. The trench was designed to accommodate a new connection to the North Reno branch, which connects two other UP routes (Overland Route and Feather River Route).

Several benefits were quantified during the EIS process. For example, the EIS quantified the overall vehicle delay caused by at-grade crossings (and how the project would minimize that delay); the number of police, fire, and ambulance calls delayed at grade crossings (and how the project would improve those delays); and the number of at-grade fatalities (and how the project would reduce them). In addition, the EIS calculated the effect on the region's economy from construction and induced employment stemming from the project. Impacts to air quality also were assessed; the project was expected to improve air quality due to increased train speeds and decreased vehicle idling. Being able

to identify and quantify the benefits of freight improvement projects helped build advocacy among the general public, as well as local and regional decision-makers and was key to the successful implementation of the project.

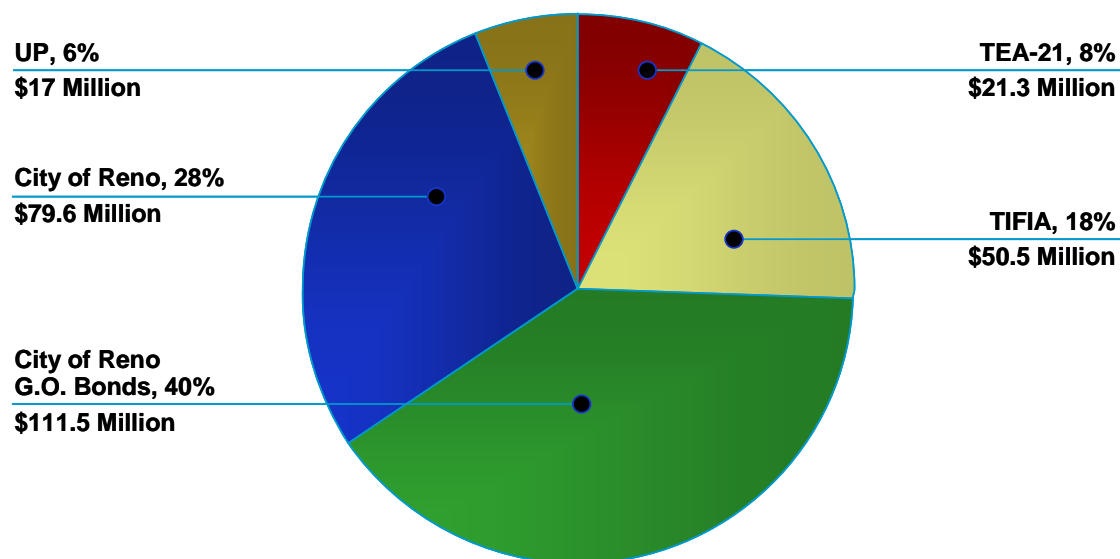
Some of the impacts of 24 trains per day (post-merger traffic) traversing the city in the at-grade alignment are:

- Vehicle delays at the 11 rail-highway crossing were estimated at 473 hours, increasing from 188 hours prior to the UP/SP merger;
- Noise inside hotel rooms was expected to increase by 2.7 decibels, aggravating the existing unacceptable noise levels; and
- Under the no-build, CO emissions were expected to increase by 68 tons in an already nonattainment area.

## Finance Arrangements

The ReTRAC cost was almost \$280 million. The ReTRAC project was funded through a public private partnership that included contributions from the UP Railroad, Federal funds and financing mechanisms, and local taxes and other sources. Figure 2 shows the share of total project costs by funding (i.e., TEA-21 earmark, UP contributions, and City of Reno funding) and by financing mechanism (i.e., TIFIA loan and City of Reno bonds). Each of these funding sources and financing mechanisms, in addition to other funding sources used to secure the project debt, are described in more detail below.

**Figure 2. ReTRAC Share of Project Cost by Funding and Financing Mechanisms**



Source: FHWA.

### ***Railroad Contributions***

UP agreed to contribute over \$58 million in cash and in-kind contributions toward completion of the project. These included the donation of land, air rights, right-of-way, construction and funding of the track ballast and ties, and funding the signal system. The construction of track ballast and ties accounted for \$17 million of the \$58 million in contributions. The rest consisted of in-kind donations of land and air rights to the City of Reno that were intended to generate revenue to pay back the city's debt obligations and the TIFIA loan.

- **Lease Income from Railroad-Owned Properties** – UP agreed to donate 77 parcels of land within the City of Reno and lease the property back from the city. The leases currently produce about \$1.1 million a year. It is anticipated that the lease income will increase by an average of 3.5 percent every year. This stream of income is forecast to result in about \$34.0 million for the project over 25 years.
- **Air Rights over Depressed Tracks** – UP also agreed to donate the air rights over the depressed tracks to the City. The air rights over the depressed tracks are estimated to be valued at \$5.0 million over the next 25 years.
- **Right-of-Way through the City** – UP agreed to donate the right-of-way of the depressed tracks to the City. This end of the deal seemed to benefit the railroad by transferring the responsibility of any hazardous waste finding along the right-of-way to the City and freeing the railroad from any liability.
- **Track Ballast, Ties, and Signal System** – UP is responsible for constructing and funding the track ballast and ties along the route. In addition, UP also agreed to pay for all the rail signal systems to be installed along the corridor. The cost associated with this work is approximately \$17.0 million.

### ***Federal Sources***

Approximately \$21.3 million in Federal grants, earmarked within the TEA-21 legislation, was used for the project. These funds were passed to the City of Reno through the Nevada DOT.

The project was approved for up to \$73.5 million in TIFIA credit assistance that was to be repaid through local revenue sources, including:

- One-eighth-cent sales tax;
- A one percent hotel occupancy tax;
- Lease income from UP properties; and
- Tax assessments from downtown special assessment district.

The TIFIA loan of \$50.5 million closed in 2002, and was funded in 2004. This TIFIA loan was repaid in May 2006 through refinancing to the capital markets. By refinancing, the city of Reno transferred the financial risk to the private sector. The remaining amounts of

the TIFIA credit were not used for the ReTRAC project. One of the reasons was the lengthy application process, as well as oversight and reporting requirements of the TIFIA program.

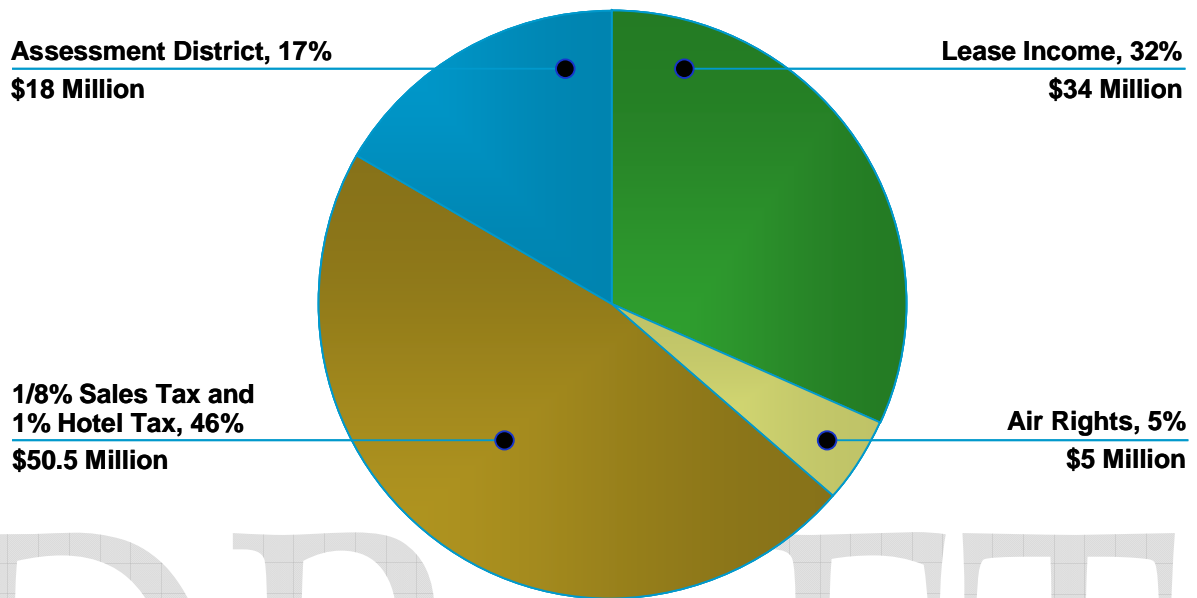
### ***Local Taxes/Other Sources***

Several types of local taxes and other sources were used, some of which were dedicated to repay project debt. Local sources included:

- **Sales Tax** – Washoe County and the state legislature approved a one-eighth-cent sales tax with proceeds targeted directly at the ReTRAC project. The sales tax and the hotel occupancy tax (see below) were dedicated revenues to pay back the city obligations, including revenue bonds, and the TIFIA loan.
- **Downtown Hotel Occupancy Tax** – Downtown hotels agreed to and the state legislature passed a one percent occupancy tax with proceeds targeted directly at the ReTRAC project.
- **Downtown Special Assessment District** – A special assessment district within the downtown core was created to generate \$18 million to secure another TIFIA loan, which the city decided not to pursue. Eventually, these revenue were used to secure the city debt. This funding was targeted at the sound and congestion improvements associated with the ReTRAC project.
- **Bond Proceeds** – The City of Reno issued \$111.5 million in Sales and Hotel Tax Revenue bonds for the project.
- **Cash-On Hand and Interest Earnings** – Almost \$80 million was provided by the city in cash.

Figure 3 shows the sources dedicated to repay debt from the ReTRAC project. As mentioned earlier, the sales and hotel taxes were dedicated to repay the original TIFIA loan. The lease income and air rights revenue comes from in-kind donations from the UP railroad.

Figure 3. ReTRAC Sources to Repay Debt



### Methods of Evaluation for Decision-Making

During the preparation of the Environmental Impact Statement (EIS), several alternatives were considered. Project alternatives included:

- Downtown depressed trainway;
- Partially depressed trainway;
- At-grade trainway, with combination of street overpasses and underpasses to eliminate at-grade highway-rail crossings;
- Elevated trainway;
- Trainway in tunnel;
- Move corridor to one of these corridors: 2<sup>nd</sup> Street, 4<sup>th</sup> Street, or I-80 alignment; and
- Rail relocation (bypass) outside the urban area (Truckee Meadows bypass or North MacCarran Boulevard corridor).

These alternatives were evaluated based on eight criteria for the initial screening process, including:

1. Eliminates grade crossing;
2. Improves vehicle traffic circulation in the downtown area;

3. Improves public safety (e.g., reduces rail/vehicle/pedestrian conflicts, and effect on emergency services access);
4. Continues freight service to existing customers;
5. Promotes economic development;
6. Maintains Amtrak service;
7. Has a reasonable costs (set at less than \$400 million); and
8. Engineering reasonableness.

After the initial screening, four variations of the downtown depressed trainway alternative were further evaluated for the final EIS (FEIS).

### Comparison of Outcomes to Expectations

In addition to the transportation benefits of the project, the redevelopment potential of the freed up land, including potential air rights is expected to produce a large benefit for the community; the Reno City Redevelopment Agency currently is studying the best mixed use development plan for the corridor.

According to the City of Reno, the project is viewed locally as a success. First, the project was completed on-time and on-budget, which can be attributed to the use of innovative contracting through a design-build contract. While the actual benefits of ReTRAC have not been measured, they are noticeable. The city has experienced noise reductions by having trains operating inside the trench; visual obstacles such as overhead signals have been removed; and pedestrian and vehicular safety has been improved by eliminating the coalition potential throughout the corridor. The latter could be measured in the future by comparing accident data before and after the project implementation, although there are no current plans to implement such analysis.

## ■ Heartland Corridor

The Heartland Corridor project is expected to make the most direct rail route from the Port of Virginia (Newport News) to Columbus, Ohio and west to Chicago accessible to double-stack container trains, reducing trip length by over 200 miles. Currently, double-stack container trains need to travel via Harrisburg and then west or to Knoxville and then north through longer routes to reach the Midwest.

The Heartland Corridor project includes five separate intermodal projects designed to improve mobility and increase freight capacity. These projects are:

- **Double-Stack Clearance between Roanoke, Virginia through West Virginia to Columbus, Ohio** - The core of the Heartland Corridor project is the double-stack

clearance (or Central Corridor) component. Realization of the double-stack clearance helps justify related corridor projects, such as the Commonwealth Railway relocation to serve the APM/Maersk and Craney Island terminals, the terminal at Rickenbacker, and providing opportunities for market access in western Virginia and West Virginia (with the construction of intermodal facilities in Roanoke, Virginia and Prichard, West Virginia). Double-stack clearance and Commonwealth Railway relocation to be completed by 2009. Federal funding was earmarked to this project through the Projects of National and Regional Significance (PNRS), and design work currently is underway.

- **Three New or Expanded Intermodal Facilities** – The Heartland Corridor project also includes the construction of new or expanded intermodal facilities in three locations along the corridor: Roanoke, Virginia; Prichard, West Virginia; and Columbus, Ohio.
  - **Roanoke Intermodal Facility, Virginia.** The construction cost of this intermodal facility is estimated at \$18 million. A rail grant from the State of Virginia will provide \$12.6 million for implementation of this facility.
  - **Rickenbacker Intermodal Facility in Columbus, Ohio.** The Rickenbacker Airport in Columbus, Ohio, is an international multimodal cargo airport with Foreign-Trade Zone (FTZ) status that serves as a national and international distribution hub. The facility also is a high-speed international logistics hub with a strategically planned cargo complex that serves several key business segments, including international airfreight, freight forwarding, corporate aviation, e-commerce fulfillment, and distribution. The Columbus Regional Airport Authority has partnered with Norfolk Southern Corporation to create an intermodal facility adjacent to the Rickenbacker Airport property. The new Rickenbacker Intermodal Facility currently is under construction, and is expected to be operational by early 2008. The facility will relieve pressure on the area's existing intermodal facility at Discovery Park. Discovery Park has been operating at capacity for several years, forcing Norfolk Southern to turn away business from the Central Ohio region. The facility is projected to handle over 300,000 container transfers per year.
  - **Intermodal Facility in Prichard, West Virginia.** The construction cost of this intermodal facility is estimated at \$18 million. A feasibility study currently is underway.
- **Commonwealth Railway Relocation** – The Commonwealth Railway route is 4.5 miles long, traveling between Portsmouth and Chesapeake, Virginia. This route will be relocated to the median of the Western Freeway (Route 164/I-664), and will include a railroad grade separation overpass bridge at Highway 17. The project eliminates 14 existing at-grade crossing. The new corridor will provide access to the recently opened APM/Maersk Terminal and to the planned Craney Island Marine Terminal (scheduled to open in 2017). Rail traffic from these two port facilities is estimated to exceed one million TEUs annually. The Virginia Port Authority is the lead agency.

## Project History

In the early 1990s, Norfolk Southern (NS) had expanded its north-south routes to accommodate double-stack clearance. However, east-west routes remained as a big hole in the network, since double-stack service was not possible (except by circuitous routing) due to clearance limitations. NS could not justify the investment on the east-west route, although acknowledging the importance of providing clearance on this route. In the late 1990s, NS initiated conversations with West Virginia for potential public participation in the clearance project.

In 2003, the Rahall Transportation Institute (RTI) at Marshall University completed a study, Central Corridor Double-Stack Initiative, sponsored by the West Virginia Department of Transportation, in partnership with the Appalachian Regional Commission, FHWA, the Ohio Rail Development Commission (ORDC), the Commonwealths of Virginia and Kentucky, and Norfolk Southern Corporation (NS). The study was initiated in the spring of 2000, and the steering committee included members of the aforementioned entities. This study assessed the cost and benefits of providing double-stack clearance between Virginia and Ohio and the construction of an intermodal facility in Prichard, West Virginia. The two Class I railroads serving the corridor from Virginia to the west, CSX and NS, were invited to participate in the study; however, CSX declined to participate. The study concluded that the double-stack clearance and the intermodal facility in Prichard were economically justifiable, based on a benefit/cost ratio estimated between 2.0 and 5.1, but nothing happened immediately. However, once Maersk made plans to construct a large container terminal at Hampton Roads on Carney Island, the pressure increased to implement more direct double-stack capabilities from the Virginia ports to Midwest markets.

In early 2004, NS came up with the idea of adding the Commonwealth Railway Relocation and the Rickenbacker and Roanoke intermodal facilities to the double-stack clearance initiative as a strategy to obtain public financial support, which was followed with presentations to stakeholders and public partners in the summer of 2004. The public-private partnership to pursue public funding was developed between the Columbus Regional Airport Authority, West Virginia DOT, Virginia DOT, and the Virginia Port Authority. Although the initial plan was to seek public funding for all proposed projects as a whole, each entity went on its own to obtain Federal funding.

The project was designated as a project of National and Regional Significance under SAFETEA-LU, receiving Federal funding for the double-stack clearance project, the rail relocation, and two of the proposed intermodal facilities. It has been reported that NS had a good working relationship with the corridor stakeholders, and this relationship was key for moving this project forward and obtaining funding. Senators Robert Byrd (West Virginia) and John Warner (Virginia), Congresswoman Debra Pryce (Ohio), and former senator George Allen (Virginia) were key supporters of the project. After receiving Federal funding through SAFETEA-LU in August 2005, the NS board subsequently approved the double-stack clearance in November 2005.



The double-stack clearance project currently is underway. The design for all tunnel and bridge clearances along the corridor is ongoing, and construction will begin in the fall of 2007.

The Western Freeway Rail Corridor (where the Commonwealth Railway will be relocated) was planned in the 1980s, when Route 164 was built. All of the bridges that cross Route 164 were built to accommodate a dual set of rail tracks and provide clearance for double-stack container trains. This corridor is located at the eastern end of the Heartland Corridor. The notice to proceed for the Commonwealth Railway relocation was issued in July 2006 and construction began in July 2007. The project will be completed through a design-build contract, and is scheduled to open by the end of 2009.

The construction of the Rickenbacker Intermodal Facility was initiated in the summer of 2005, and is expected to be operational by early 2008.

For the Roanoke Intermodal Facility, 10 potential locations have been identified based on specific criteria (as discussed later). The period for public comments on the potential locations ended in mid-January 2007. As for the Prichard Intermodal Facility, a letter agreement between NS and West Virginia was signed in 2006; this letter outlines NS obligations on this project. A feasibility study currently is underway and is scheduled to be completed by September 2007.

### **Institutional and Organizational Arrangements (Construction/Operation)**

Lawmakers from all three states, state and regional transportation and economic development agencies, the Virginia Port Authority, and Norfolk Southern are all working together to develop the Heartland Corridor project.

In July 2006, the Federal Highway Administration (FHWA), Eastern Federal Lands Highway Division (EFLHD), and the states of West Virginia, Ohio, and Virginia signed a Memorandum of Agreement (MOA) that defines the roles of the Federal government and the states on the double-stack clearance project. The following month, the FHWA, EFLHD, and Norfolk Southern (NS) signed another MOA. This MOA defines the roles and responsibilities of all parties related to the double-stack clearance project. The Federal government will be responsible of the environmental compliance, and the railroad will be responsible of the design and construction of the project. The MOA also specifies how Federal funds will be utilized for the double-stack clearance project, and is described as follows:

- SAFETEA-LU Section 1301 funds will be used for improvements in West Virginia (i.e., \$90 million);
- SAFETEA-LU Section 1702 funds will be used for improvements in Virginia for the Cowan tunnel work. Work at other tunnels in Virginia will be paid by NS and Virginia's Department of Rail and Public Transportation (DRPT);
- NS will pay for utility relocation costs;

- Work in Kentucky (one tunnel) will be fully paid by NS;
- Work in Ohio will be paid by NS and Ohio Rail Development Commission (ORDC); and
- Expenditures prior to MOA to be paid by NS.

## Project Benefits

From the literature review, the benefits of the Heartland Corridor improvements (specifically for the double-stack and the Prichard intermodal facility) were initially reported in the Central Corridor Initiative Study (February 2003) that was conducted by the Marshall University's Rahall Transportation Institute (RTI). Benefits also have been reported in presentations delivered by the Virginia Economic Development Partnership, the Commonwealth Transportation Board, and the Port of Virginia.

The double-stack clearance and Prichard Intermodal Facility benefits include:

- Travel length reduction by 120 to 370 miles (depending on location and route) for double-stack shipments on NS routes, that is, 10-36 percent reductions in distance. Compared to the Harrisburg route, the Heartland Corridor double-stack clearance reduces the travel length between the Port of Virginia and Chicago by 233 miles;
- Transit time for double-stack traffic would be reduced by one to one-half days;
- Potential reduction in inventory costs. The planned intermodal facility in West Virginia also will provide cost savings to shipper who currently must move containers by truck;
- Project benefits were estimated at \$293 million by RTI study (assuming 6.5 percent growth in intermodal traffic, including West Virginia traffic from new intermodal facility over a 20-year period, and a 6.125 percent discount rate);
- Economic value to regional shippers resulting from construction of Prichard intermodal facility - \$50 to \$83 million;
- Reductions in fuel consumption and emission were not quantified in RTI study, but are an expected benefit of the project;
- Improved mobility for motorists and truck freight along the Heartland Corridor, including some mobility benefits on the I-81 segment between Staunton and Lexington, Virginia;
- Environmental benefits from reduced emissions through use of more efficient rail transportation;

- Economic, tax, and employment benefits from the introduction of new or expanded intermodal capacity along the corridor;
- Preservation of rail infrastructure and employment on a rail corridor facing declines in other traditional traffic in Roanoke and West Virginia; and
- Improved access to the global trade network for shippers and manufacturers in Virginia, West Virginia, eastern Kentucky, and Ohio.

The Rickenbacker Intermodal Facility benefits include:

- Transportation cost savings to shippers are estimated at \$660 million over the first 10 years of operation;
- Truck mile reductions of 49 million in Ohio;
- Emissions reduction (not measured);
- The intermodal facility will add 9,500 direct jobs and 10,900 indirect jobs over 30 years; and
- Economic benefits have been estimated at \$15.1 billion over 30 years, and tax revenue growth of more than \$800 million is projected over the same period.

The Commonwealth Railway Relocation benefits include:

- The railroad relocation will move the existing rail line from densely populated areas, and will eliminate the potential for rail-related accident by eliminating the existing 14 at-grade crossings;
- Emissions and noise will be reduced by eliminating vehicle idling at existing highway-rail crossings;
- The rail relocation is expected to divert containerized traffic from the regional highway network, improving highway safety and reducing congestion;
- Faster train operations;
- The project will support regional growth by providing access to the new APM/Maersk terminal and the future Craney Island Marine Terminal; and
- The railroad will provide access from the marine terminals to New Suffolk Marshalling Yard and to the NS and CSX junctions.

## Finance Arrangements

SAFETEA-LU authorized over \$140 million for this project, including \$95 million for the double-stack clearance work, \$15 million for the rail relocation, and over \$30 million for the intermodal facilities.

Virginia has approved a \$22.35 million grant through the Rail Enhancement Fund to pay for the Virginia components of the Heartland Corridor (double-stack clearance and Roanoke intermodal facility). The Rail Enhancement Fund grant requires a 30 percent match, which is expected to come from Norfolk Southern. Another Rail Enhancement Fund grant has been awarded for the Commonwealth Rail Relocation, providing \$3.36 million for this project along with \$1.44 million in Commonwealth Railway matching funds. In April 2006, the Ohio Rail Development Commission (ORDC) approved \$836,355 to pay for the double-stack clearance work in Ohio, with matching funds required (10 percent) from Norfolk Southern.

Other funding for the Commonwealth Railway relocation project includes \$36.0 million from the Virginia State General Fund, and \$3.75 million from the State to match the SAFETEA-LU earmark.

The total Heartland Corridor costs (approximately \$309 million) are distributed among the different project elements as follows:

- **Heartland Corridor Double-Stack Clearance (\$151 million)** – Funding for this project will be provided by:
  - SAFETEA-LU earmark – \$95 million (subject to obligation limitation);
  - Virginia Rail Enhancement Grant – \$9.75 million;
  - ORDC Grant – \$836,355; and
  - NS – remaining funding.
- **Grant agreements with Virginia and ORDC were signed in May 2006.** The financial plan (dated May 2007) shows the project cost at almost \$160 million. Applying the obligation limitation of Federal funds (actual for 2005 through 2007, assumed at 85 percent for 2008 and 2009), the Federal earmark is estimated at \$82.6 million.
- **Intermodal facility in Prichard, West Virginia (\$18 million)** – No funding has been committed to date for the intermodal facility in Prichard, West Virginia. A feasibility study currently is underway, and potential funding sources include state funding earmarked recently to create the Special Railroad and Intermodal Enhancement Fund.
- **Intermodal facility in Roanoke, Virginia (\$18 million)** – Funding for the Virginia intermodal facility includes:
  - Virginia Rail Enhancement Grant – \$12.6 million; and
  - NS – \$5.4 million.

- **Intermodal Terminal in Columbus, Ohio (Rickenbacker) – \$62 million:**

- SAFETEA-LU earmark – \$30.4 million; and
- NS – remaining funding.

The new intermodal facility will be a public-private partnership among Norfolk Southern, the Columbus Regional Airport Authority, and other government agencies. The Airport Authority is paying for various environmental and traffic studies, and currently is working with Pickaway County, Franklin County, the City of Columbus, Mid-Ohio Regional Planning Commission, Ohio DOT, and FHWA to obtain funding for the other needed improvements. Additional investment, beyond the intermodal facility construction, includes road and utility work estimated at \$35 million.

- **Commonwealth Railway Mainline Safety Relocation Project – \$59.6 million:**

- SAFETEA-LU earmark – \$15 million;
- Virginia Rail Enhancement Grant – \$3.36 million;
- Commonwealth Railway match to Rail Enhancement funds – \$1.44 million;
- Virginia State General Funds – \$36 million; and
- Virginia’s match to Federal funds – \$3.75 million.

Table 5 summarizes the various funding sources for the Heartland Corridor.

**Table 5. Heartland Corridor Funding**

<b>Funding Source/ Financing Mechanism</b>	<b>Amount (Millions)</b>	<b>Comments</b>
FHWA Projects of National and Regional Significance	\$90.0	For double-stack clearance work
FHWA Projects of National and Regional Significance	\$15.0	For Commonwealth Railway Relocation
FHWA High-Priority Projects	\$5.0	For double-stack clearance work
FHWA High-Priority Projects	\$30.4	For Rickenbacker Intermodal Facility
VA Rail Enhancement Fund	\$25.7	For double-stack clearance (Virginia), Roanoke intermodal facility, and Commonwealth Railway Relocation
State General Funds (Virginia)	\$36.0	For Commonwealth Railway Relocation
VA Match to Federal Funds	\$3.7	For Commonwealth Railway Relocation
Commonwealth Railway	\$1.4	Matching funds to Rail Enhancement grant for the Commonwealth Railway Relocation
ORDC Grant (Ohio)	\$0.8	For double-stack clearance work

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Norfolk Southern	\$82.9	Includes matching funds for Virginia Rail Enhancement Fund and ORDC grants (double-stack clearance and Roanoke intermodal facility), and funding required to cover projected costs of all Heartland Corridor elements (excluding Prichard Intermodal Facility)
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Sources: FHWA, SAFETEA-LU Legislation, available at <http://www.fhwa.dot.gov/safetealu/index.htm>, and Public Private Partnership Case Studies, <http://www.fhwa.dot.gov/ppp/heartland.htm>; Virginia Department of Rail and Public Transportation, <http://www.drpt.state.va.us/projects/current/rail-fund.aspx>; Ohio Rail Development Commission, <http://www.dot.state.oh.us/OHIORAIL/>; Draft Environmental Assessment – Commonwealth Railway Mainline Safety Relocation Project; Columbus Regional Airport Authority; Virginia Port Authority.

## Methods of Evaluation for Decision-Making

According to the RTI study, five rail routes were considered initially for double-stack clearance between Norfolk and Columbus, via central Appalachia: two NS routes and three CSX routes. Of the three CSX routes, the north-south route through eastern Kentucky was eliminated because of its low potential to enhance regional access to international markets. The other two CSX routes were eliminated from further consideration primarily because CSX declined to take part in the study. Therefore, two NS routes remained: 1) the former Norfolk & Western (N&W) mainline; 2) and the West Virginia secondary route from Kellysville to Columbus, Ohio via Charleston and Point Pleasant. The latter was eliminated because physical and operational characteristics that would significantly increase the capital costs of implementing double-stack operations. On the selected NS route, the RTI study estimated preliminary capital costs assuming different construction methods to provide double-stack clearance on the 28 tunnels along the route, and provided a range of construction costs.

A simulation model, RAILNET, was used to simulate NS systemwide operations under conditions where the West Virginia route is cleared for double-stack. The model predicted volumes on each link in the rail network and it was used to determine the potential cost impact (either positive or negative) of moving intermodal shipments under the double-stack clearance scenario. The analysis suggested that the diversion of intermodal traffic to a West Virginia route would not materially affect the shipping costs of other NS movements.

Another model was developed to predict container traffic generated from implementation of an intermodal facility in Prichard, West Virginia. The model used variables such as: availability of CSX intermodal service at shipment origin, population at shipment origin, and distance, among others. The model estimated West Virginia container traffic at over 11,600 containers in the first year of operation.

For the Roanoke Intermodal facility, the Virginia DRPT developed some criteria for selection of potential sites for Roanoke region intermodal terminal:

- Close proximity to I-81 and reasonable access/egress;
- Within Heartland Corridor, between Walton and NS' Shenandoah Line;
- Avoid new at-grade crossing, especially in urban areas;
- At least 65 acres;
- Minimize associated roadway costs; and
- Efficient from rail operation perspective.

## Comparison of Outcomes to Expectations

The Heartland Corridor project currently is under implementation, and no information is available related to project outcomes versus project expectations.

### ■ Trans-Texas Corridor I-35 (TTC-35)

The TTC-35 is part of a proposed statewide multimodal network of transportation routes that will incorporate existing and new highways, railways, and utility rights-of-way. Each corridor is envisioned to include:

- Separate lanes for passenger vehicles and large trucks;
- Separate freight and passenger rail lines; and
- Utility corridors for water lines, oil and gas pipelines, and transmission lines for electricity, broadband, and other telecommunication services.

Plans call for the TTC to be completed in phases over the next 50 years with routes prioritized according to Texas' transportation needs. TxDOT will oversee planning, construction, and ongoing maintenance, although private vendors will be responsible for much of the daily operations. The cost of the full TTC concept is estimated at almost \$200 billion.

## Project History

Interstate Highway 35 in Texas is a major NAFTA corridor serving the largest port of entry, Laredo, on the Mexican border. Heavy interstate truck traffic, including high percentages of NAFTA trade, combined with local congestion on IH-35 has made it one of the most congested Texas corridors. Development of a toll road to augment highway capacity along Interstate Highway 35 in Texas occurred in three distinct phases. First, State Highway 130, a bypass of IH 35 east of Austin, was programmed and developed by the Texas Turnpike Authority division of the Texas Department of Transportation as part of the Central Texas Turnpike System. Second, the Texas Department of Transportation announced the multimodal Trans-Texas Corridor initiative, and subsequently awarded a

Comprehensive Development Agreement (CDA) for the overall development of TTC-35. Third, the Texas Department of Transportation entered into a project-specific agreement with the TTC-35 CDA developer for Sections 5 and 6 of SH 130, extending SH 130 to the south to Interstate Highway 10 near Seguin, east of San Antonio. SH 130 and these extensions will become part of TTC-35.

## **Institutional and Organizational Arrangements**

In 1997, the Texas Legislature did away with a separate Texas Turnpike Authority and split it into two entities: the Dallas area offices and facilities were transferred to a regional tollway authority, the North Texas Tollway Authority, and the statewide toll road authority was moved to a new division within TxDOT, the Texas Turnpike Authority Division (TTA), and turnpike authority activities were overseen by a separate governor appointed board. The TTA advanced environmental studies for the State Highway 130 project, a 49-mile controlled access toll road from IH 35 near SH 195 north of Georgetown to U.S. 183, north of Lockhart. In 1997, the Texas Legislature granted the TTA the authority to enter into exclusive development agreements (EDA), a kind of design-build authority. In 2001, the Legislature did away with the TTA's independent Board, leaving the Transportation Commission the sole decision-making body on toll road matters within TxDOT.

It was in this form that the Texas Transportation Commission in 2002 executed an EDA with Lone Star Infrastructure, a consortium of firms led by Fluor, Balfour Beatty, and T.J. Lambrecht to design and construct the roadway, executed a TIFIA loan with the U.S. Department of Transportation, and issued debt for the construction of the Central Texas Turnpike Project (which in addition to the SH 130 segments being delivered through the exclusive development agreement, also included SH 45 and an extension of Loop 1).

That same year, Governor Rick Perry announced his vision for a series of privately financed, multimodal transportation corridors (toll roads and truck lanes, rail, utilities, pipelines), which he called the Trans-Texas Corridor. As the Transportation Commission took action on the Central Texas Turnpike System in 2002, they also launched a series of efforts to put the Governor's vision into action. Later that same year, Fluor presented TxDOT with an unsolicited proposal to expand upon its SH 130 project and construct a segment of a corridor from north of Dallas, to Waco, Austin, and San Antonio and to the Texas-Mexico border. TxDOT did not have a policy or procedure for considering unsolicited proposals.

Encouraged by this private sector interest and in order to provide for a process for consideration of private proposals, in 2003, the Texas Legislature enacted dramatic new legislation that authorized new CDAs, in which everything from design, construction, financing, and operation could be delegated to the private sector in return for concession payments or revenue sharing. In 2003, TxDOT selected a series of firms to advise the State on PPP procurements, and in 2004, TxDOT solicited and received three separate proposals for what was by then known as TTC-35. In late 2004, Cintra-Zachry was chosen as the overall developer of TTC-35 and a contract was executed in early 2005. This contract gives



the developer certain rights and obligations as the master developer for the entire corridor, and allows the developer to propose specific segment development agreements along the corridor. TxDOT also has been coordinating Tier 1 environmental studies for the TTC-35 corridor, and published a draft environmental impact statement for the Tier 1 review (10-mile preferred corridor identification).

In 2006, TxDOT entered into a project facility concession agreement with Cintra-Zachry for the financing, design, construction, and operation of Segments 5 and 6 of SH 130 extending from U.S. 183 to IH 10, about 40 more miles. This particular agreement sets out a modest concession fee and a revenue sharing mechanism that increases the State's share of revenues as the road becomes more successful, and revenue sharing that also increases depending on the overall speed limit the state sets on the road (higher speed limit, more revenue sharing). Once final environmental approvals are received for the road, TxDOT will issue a notice to proceed, after which the developer is responsible for designing and constructing the roadway to certain standards by certain times, maintaining it to certain standards, and setting the standards by which the roadway is to be returned to the State at the conclusion of the 50-year lease.

## Project Benefits

TxDOT is in the process of completing studies to more precisely estimate the extent to which TTC-35 is expected to change freight patterns and reduce congestion on IH 35. However, there are documents that list expected benefits from the projects.

The TTC-35 DEIS describes the intended benefits of the project as follows:

- **Accommodate Projected Population Growth and Subsequent Traffic Demand -** Forty-five percent of Texas' 21 million residents live within 50 miles of IH 35. Population growth in the 77 county DEIS study area is expected to grow by 145 percent between 2000 and 2060.
- **Facilitate Congestion Management -** Urban areas along IH 35 already are experiencing congestion. The travel time index (additional time needed to travel in peak periods versus normal speeds) in Dallas-Fort Worth is 1.34, 1.31 for Austin, 1.23 for San Antonio, and 1.07 for Laredo. Traffic projections to 2060 show the majority of IH 35 in rural and urban areas in a failing volume-capacity ratio.
- **Accommodate Increasing Freight Volumes -** In rural IH 35 segments, trucks comprise 20 to 38 percent of total traffic. By 2025, statewide freight volumes are expected to grow by 132 percent over 1998 levels, with a 403 percent increase over 1998 levels by 2060.
- **Improve Safety -** By constructing separate truck lanes in TTC-35, traffic safety is expected to improve. From 1993 to 2003, 691 people died in 611 crashes involving a fatality, almost 24 percent of all interstate highway fatalities in Texas. Twenty-four percent of these fatal crashes along IH 35 involved a truck. Of the 2,367 truck-related

deaths on Texas interstate highways, 85 percent of the fatalities were not truck passengers.

- **Enhance Economic Vitality** – Full build out of the TTC-35 corridor is estimated to produce 434,000 permanent jobs at project maturity, 35 percent of which are in the trade sector and 27 percent in the services sector.

While the traffic and revenue forecasts for the SH 130 project do not include separate truck forecasts, they do indicate the level of congestion relief expected for IH 35. In the 2002 traffic and revenue forecast prepared for the CTTS bond issue, URS, and Vollmer estimated traffic volumes along four screenlines on SH 130. IH 35 traffic began as 74 percent of total 2007 volumes across Screenline 1, toward the northern end of SH 130 between Georgetown and Round Rock, but decreased to 61 percent of total volume by 2025. Total changes for IH 35 from 2007 to 2025 in Screenline 2 (south of Round Rock) were 55 percent to 43 percent; from 59 percent to 49 percent for Screenline 3 in North Austin; and from 76 percent to 59 percent for Screenline 4 in South Austin. This indicates that SH 130, as it grows, will reduce total volumes on IH 35. In 2005, URS and Vollmer produced an updated traffic and revenue report in advance of the Segments 5 and 6 negotiations. The screenline volumes from 2007 to 2030 for IH 35 were as follows: Screenline 1 – 78 percent to 63 percent; Screenline 2 – 64 percent to 44 percent; Screenline 3 – 67 percent to 49 percent; and Screenline 4 – 76 percent to 55 percent. The increased effect of SH 130 on IH 35 and IH 35's larger share of current traffic in the update is due to an increase in baseline demographics, delays in construction of other competing facilities, and the effect of Sections 5 and 6 being completed. All of which means that these two phases of TTC-35 (Sections 1 through 4 as EDA, Sections 5 and 6 as CDA) are expected to have a positive effect on IH 35.

## Finance Arrangements

Given the difference in timing and development mechanisms in SH 130, there are two separate financial arrangements for the current TTC-35, which are summarized below.

### *SH 130, Segments 1 through 4*

The 2002 Official Statement for the Central Texas Turnpike Project bond offering specified the following financial summary, which includes not only the SH 130 project, but the SH 45 and Loop 1 projects:

**Sources of Funds (000s)**

Proceeds of Series 2002 Obligations and Series 2002 First Tier Note	\$2,267,835
2002 TIFIA Bond <sup>1</sup>	16,760
Funding Obligations of Commission	700,000
Funds Provided by Contributing Subdivisions and Commission for ROW	511,710
Interest Earnings <sup>2</sup>	160,435
<b>Accrued Interest</b>	<b>3,168</b>
<b>Total Sources of Funds</b>	<b>\$3,659,909</b>

**Uses of Funds (000s)**

Construction Costs	\$2,247,098
ROW Costs	694,902
Capitalized Interest <sup>3</sup>	524,776
Debt Service Funds (Accrued Interest)	3,168
First Tier Debt Service Reserve Fund Requirement	129,999
Bond Insurance	42,691
<b>Issuance Costs, including Underwriters' Discount</b>	<b>17,274</b>
<b>Total Uses of Funds</b>	<b>\$3,659,909</b>

Note that the 2002 TIFIA loan for this project is intended to finance the 2007 and 2008 refinancing of Series 2002 Second Tier Bond Anticipation Notes (principal amount of \$900 million). This project made use of state highway fund contributions, local government contributions for ROW, a TIFIA loan, and traditional public finance project revenue bonds. This financing supported a fixed price design-build contract through the State's first EDA for SH 130, while SH 45 and Loop 1 were constructed through design-bid-build methods by TxDOT.

TxDOT agreed in the bond covenant not to construct competing facilities to SH 130 that would affect the State's ability to comply with its rate covenant and repay its financial obligations, with the exception for state highway projects necessary for improved safety, maintenance, and operations, projects for high-speed passenger rail, and HOV projects necessitated by air quality conformity requirements. TxDOT has reserved the right to transfer the project to another tolling authority under certain conditions.

<sup>1</sup> Interim funding is provided by the Series 2002 Second Tier BANS. It is assumed that up to \$900,000,000 of the 2002 TIFIA Bond will be drawn down in 2007 and 2008 to refinance the Series 2002 Second Tier BANS. See "2002 Project Estimated Cash Flow and Debt Service Coverage Table" and "Plan of Finance - Secured Loan Agreement and 2002 TIFIA Bond."

<sup>2</sup> Based on expected investment earnings in the Debt Service Fund, the Construction Fund, and the First Tier Debt Service Reserve Fund. See "PLAN OF FINANCE - Interest Earnings," "INVESTMENT AUTHORITY AND INVESTMENT PRACTICES OF THE COMMISSION" and "RISK FACTORS - Unpredictability of Investment Earnings" and "- Forward- Looking Statements."

<sup>3</sup> Funded from initial deposit of \$211,181,670.79 in the First Tier Debt Service Fund and \$227,721,177.21 in the Second Tier Debt Service Fund plus investment earnings on such amounts and, with respect to the Series 2002 First Tier Bonds, the amounts in the First Tier Debt Service Reserve Fund.

TxDOT transferred most construction, design, and right-of-way acquisition risk on SH 130 to the private developer under the EDA, with certain limited exceptions, and with contractual provisions for payment associated with early delivery. TxDOT also agreed to provide an operating and maintenance backstop for this new project, which means that the State is obligated to be responsible for operations and maintenance expenses beyond those raised by project revenues. However, given that the State is financially responsible for the project, both to its primary and secondary lineholders, if project costs come in lower than anticipated, then the State's financial obligations from the state highway fund can be reduced. If project revenues come in higher than expected, then the State has the benefit of all of that increased revenue.

### Sections 5 and 6

The following financial information is provided in Exhibit 5 to the Sections 5 and 6 Facility Concession Agreement:

#### Sources of Funds during Construction Period (000s)

##### Cintra-Zachry Equity Funding:

Cintra Concesiones de Infraestructuras de Transporte SA	\$215,397
Zachry American Infrastructure	116,000
Total Developer Equity Funding	331,397
TIFIA Loan	412,050
<b>Bank Debt Funding</b>	<b>596,500</b>
<b>Total Sources of Funds</b>	<b>\$1,339,947</b>

#### Application of Funds during Construction (000s)

Construction Costs (Civil Works)	\$924,219
IT and Other Investments	34,168
Right-of-Way	111,840
Payment to TxDOT	25,666
Upfront and Construction Expenses	20,000
Interest Expense	151,287
Finance Costs/Fees	25,546
Operating Costs	33,220
<b>Deposits to Reserves</b>	<b>14,000</b>
<b>Total Applications of Funds</b>	<b>\$1,339,947</b>

In addition to the \$596 million in bank debt listed above, Cintra-Zachry also plans on securing a \$170 million tranche of bank debt for liquidity purposes during construction.

Using the CDA mechanism, TxDOT has transferred finance, traffic, design, construction, and operating risks wholly to the private sector developer. Doing so, TxDOT is able to gain the construction of this major project with no state highway fund contributions, freeing scarce resources for other projects statewide. TxDOT has gained \$311 million in developer equity contributions, reducing the amount of the project cost that needs to be financed by project revenues through public or private debt. Rather than seek a larger up-front concession payment, TxDOT has accepted a \$25 million concession fee payable upon notice to proceed (after environmental clearance) and revenue sharing over the 50-year term of the facility concession agreement.

## Methods of Evaluation for Decision-Making

### *EDA (Segments 1 through 4)*

Original administrative rules for the EDA process were published in the Texas Register on October 23, 1998. The Texas Turnpike Authority reserved the right to solicit exclusive development agreements and proposers would be evaluated to determine their financial condition, management stability, technological capability, experience, staffing, organizational structure, project commitment, and other qualities the Authority deemed relevant. The Authority will rank proposals which are responsive to the RFP, and the top-ranked proposer would then be required to submit a financial feasibility certificate (a third-party financial review of the proposal's financing plan) before negotiating an exclusive development agreement with the Authority.

### *CDA (Segments 5 and 6)*

According to TxDOT publications, CDAs are developed as follows:

- The selection process for a CDA is a two-step competitive process that is initiated by an unsolicited proposal or solicited proposals submitted at TxDOT's request. In both cases, the selection process first begins with conceptual proposals. These proposals are evaluated based on their compatibility with regional and state transportation plans, as well as a proposal's ability to support the department's goals. If the Texas Transportation Commission concludes the conceptual proposals are viable, it will make an official request for detailed proposals, which is the second step in the competitive selection process. In step two, the detailed proposals go through a thorough evaluation process to identify the proposal that offers the State the best value.

Proposals are evaluated for their adherence to specific project performance specifications, and for the extent to which the combination of financial proposal (concession fees, revenue sharing) and project delivery (construction cost savings, time of project delivery) combine to provide the state with a best value proposal.

With the evolution from exclusive development agreement rules to the SH 130 requests for proposals issued in 2000, to the CDA procurement documents now in use, TxDOT has shown a willingness to adjust to changing market forces and change its project expectations (moving from design-build to design-build-operate-maintain-finance, from up front concession fees to revenue sharing), provide more specificity in its procurement documents and move to performance-based criteria.

## Comparison of Outcomes to Expectations

The Central Texas Turnpike opened to traffic in the fall of 2006, nearly a year ahead of schedule and \$350 million under budget. Sections 1 and 2 of SH 130 were opened to traffic in October and December 2006, respectively. As of July 2007, the first 28-mile segment of SH 130 had 33,100 average weekday toll transactions, 48 percent higher than projections.

## ■ Lessons Learned/Observations

### *Funding and Financing Arrangements*

All four case studies were or are being funded through a combination of Federal, state, local, and private funding. In addition, funding sources and financing arrangements vary significantly for each project. Of the four case studies, the simplest funding arrangement is for Phase I of the CREATE program, as it only includes funding from Federal, state, and local earmarks and private funding. The funding and financing arrangement for each project is described as follows:

- **CREATE** - Funding from Federal, state, and City of Chicago earmarks, and private funding;
- **ReTRAC** - Federal and local earmarks, private funding, TIFIA loan and revenue bonds backed by dedicated revenues (i.e., sales tax, hotel tax, lease income, and tax assessments from special assessment district);
- **Heartland Corridor** - Federal earmarks, state grants and matching funds, and private funding; and
- **TTC-35 (SH 130 Segments 5 and 6)** - Private equity, private debt, and TIFIA loan.

### *Federal Participation*

Note that all four projects had Federal financial support at some level, whether it was through a TIFIA loan, earmarks, or both. Federal funding and loans for these projects was generally under 30 percent of the cost, except for the Heartland Corridor, for which Federal funding accounts for about 48 percent of the project costs (excluding the Prichard Intermodal facility). Two of the projects reviewed here were funded under the new SAFETEA-LU program for Projects of National and Regional Significance. This is anticipated to be the forerunner of an expanded effort in SAFETEA-LU reauthorization to fund such national significance projects. There already are several reauthorization proposals, including American Road and Transportation Builders Association's (ARTBA) Critical Commerce Corridors which would be a new freight-oriented program of national significance (separate from the core programs) with its own user fees and decision-making processes.

### *Financing Alternatives*

In terms of financing techniques, Federal credit was provided through TIFIA for ReTRAC and the TTC-35, facilitated by dedicated revenue streams to support these projects. In addition, the city of Reno issued debt backed by sales tax and hotel tax revenues. Private debt and the TIFIA loan for the TTC-35 project will be backed by tolls collected on the facility.

### *Private Funding Commitments*

Private contributions for each project have varied significantly. For the CREATE project, the private contribution was determined through an assessment of the project benefits

realized by the railroads. For the Heartland Corridor, improvements are being made on privately owned infrastructure, and as project sponsor, NS will provide matching funds for the Federal earmarks and state grants provided for the double-stacking clearance and the intermodal facilities. In the case of ReTRAC, the project was initiated by the public sector, and private contribution accounted for a small share of the project costs, mostly from in-kind contributions in the form of land, right-of-way, and air-right transfers to the City of Reno.

The TTC-35 project (SH 130 Segments 5 and 6) is the only project that consists of a publicly owned facility to be developed and operated through a concession agreement. In this case, the only public contribution is a TIFIA loan to be repaid with toll revenues. Private contributions include equity and private debt that will be used to pay for the design and construction of the facility, and provide an upfront payment of \$25 million to TxDOT. In addition to the upfront payment, the concessionaire will share toll revenues with TxDOT over the life of the agreement. The concession agreement transferred the design and construction of the facility, and the operation and toll collection over a period of 50 years, which led to a higher private participation in financing the project. Segments 1 to 4 of SH 130 were financed through public funding and public debt, also including a TIFIA loan. In this case, the procurement method was a design-build contract, which is the simplest form of public-private partnership.

### ***Political Support***

All these projects required strong commitment and support of elected officials, especially for those projects that received Federal earmarks. Elected officials from Illinois, West Virginia, and Virginia have been mentioned as key supporters who made possible Federal funding allocations through SAFETEA-LU. The governors of Illinois and Texas, and public officials of the City of Reno and Mayor Daley of Chicago are mentioned also as important players and champions in promoting these projects.

### ***Benefits***

All these projects are expected to generate significant public benefits, which is a key consideration for public participation, especially on those projects that include improvements to privately owned infrastructure.

In the case of CREATE, the assessment of benefits was important to determine the level of private funding to be provided by the railroads participating in the program. For ReTRAC, the assessment of benefits was used to engage and gain support from stakeholders. The study by the Rahall Transportation Institute (RTI) at Marshall University of the Heartland corridor showed a clear public and private benefit which was important in development of support for the project.

### ***Institutional Arrangements***

A common characteristic of the three freight rail projects included in this paper is that both the public and private sectors worked together closely from initial concept through implementation, and that good relationships between both groups were important to ensure both implementation and funding commitments.

Signed agreements between the public and private sector are common for public-private partnerships to define the roles, responsibilities, and financial commitments of all parties involved in the project, as it was done for the CREATE program and the Heartland Corridor project. It is interesting that none of the rail projects reviewed followed the model of the Alameda Corridor project where a separate institution (Joints Powers Authority) was created to build and operate the project. Some have suggested that the CREATE project would benefit from such an institutional structure as compared to its rather complex multi-institutional committee structure.

In the case of the TTC-35, the CDA signed between TxDOT and the concessionaire (Cintra-Zachry) defines the standards by which the roadway should be maintained, the conditions for revenue sharing (including sharing of refinancing gains), and conditions for constructions of competing facilities, among several other terms that are included to ensure that TxDOT and public interests are protected.

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